REMARKS

This amendment is responsive to the Office Action mailed September 21, 2005. Filed herewith is a Request for a Three Month Extension of Time, which extends the statutory period for response to expire on March 21, 2006. Accordingly, Applicant respectfully submits that this response is being timely filed.

Amendments have been made to the claims as identified and explained below, and the Applicant believes these claims are now in proper condition for allowance.

Provisional Double-Patenting Rejections

At ¶4 of the Office Action, the Examiner rejects claims 1-26 under obviousness-type double patenting as being unpatentable over claims 17-54 of copending application number 10/164,789. Accordingly, a terminal disclaimer is submitted herewith to overcome these rejections, so these rejections should be withdrawn.

At ¶5 of the Office Action, the Examiner rejects claims 1-26 under obviousness-type double patenting as being unpatentable over claims 17-54 of copending application number 10/165,457. Accordingly, a terminal disclaimer is submitted herewith to overcome these rejections, so these rejections should be withdrawn.

35 USC 102 – Novelty

At ¶7 of the Office Action, the Examiner rejects claims 13, 19, 24 and 28 under 35 U.S.C. §102(e) as being anticipated by Walters. The Applicant traverses these rejections for at least the following reasons.

Regarding claim 13, the Applicant respectfully submits that the Examiner's analysis in paragraphs 2 and 7 of the Office Action does not show anticipation of Claim 13 by Walters. For example, in Claim 13 as previously amended, the step of "determining whether target code has previously been generated and stored for that portion of program code for the subsequent conditions" requires a determination to take place which is based on (i) knowledge of the subsequent conditions and (ii) on the previous generation of target code for that portion of program code. The system described by Walters cannot make such a determination; that is, it

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cannot make the subsequent conditions relate in any way to the determining of whether target code has previously been generated and stored. The Walters system therefore does not anticipate Claim 13 as previously amended.

The Examiner appears to characterize Walters as carrying out the following steps:

    (a) encountering a portion of program code for the first time, and generating and storing all the target code necessary to execute that portion of program code for whatever conditions are prevailing at the time the translation occurs;

    (b) removing the translation generated at step (a) from the cache; and

    (c) subsequently entering the same portion of program code, looking for a translation in the cache, and when no such translation is found generating the same target code as was generated in step (a).

However, the Applicant does not agree that carrying out the steps (a)-(c) above leads to anticipation of Claim 13. The Examiner appears to equate the "subsequent conditions" of claim 13 to the performance of step (b). The applicant believes there is no other way that the Walters system can reach a position where the initial translation has occurred, and then subsequent additional translation relating to the program code also occurs. If step (b) has not occurred, then the Walters system will not perform any additional translation when it subsequently enters the same portion of program code, it will simply use the existing translation in the cache.

As set forth above, the step of "determining whether target code has previously been generated and stored for that portion of program code for the subsequent conditions" requires a determination to take place which is based on knowledge of the subsequent conditions and on the previous generation of target code for that portion of program code. The Walters system cannot make subsequent conditions such as the performance of step (b) relate in any way to the determining of whether target code has previously been generated and stored, and thus the Walters system does not anticipate Claim 13, even when a broad interpretation is given to the "subsequent conditions".

The Examiner notes that the step of generating additional target code may not be performed every time the method of Claim 13 as previously amended is performed. It is correct to say that the claim includes two possibilities - one where additional target code is generated, and one where no additional target code is generated. Although the claim includes the

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possibility that no additional target code is generated, this is not enough in itself to deny the claim novelty. Walters does not disclose the possibility of generating additional target code required to execute said portion of target code with said subsequent conditions since, as demonstrated, Walters cannot relate the subsequent conditions to determining whether target code has previously been generated and stored. This is therefore a novel feature over the system described in Walters.

In order to clarify the subject matter of claim 13, the applicant has amended this claim to further distinguish the invention of this claim from the disclosure of Walters. This amendment is supported, for example, by Applicant's Specification, paragraphs 0145-0148. This amendment renders moot the statements in the in the Examiner's Response to Arguments at page 3-4 of the Office Action relating to the fact that the prevailing set of conditions on initial translation of a given portion of are not necessarily different to the subsequent conditions whenever subsequently the same portion of the program code is entered.

The Examiner mentions at page 4 of the Office Action that Walters discloses different code generation procedures for a non-native instruction that is sometimes an exit instruction and that is sometimes not an exit instruction. However, this arrangement in the Walters system does not treat the relevant non-native instructions differently dependent on changes to prevailing conditions between initial translation and subsequent entry of the same portion of the program code. Walters takes into account the different properties of such instructions, and caters for the different possibilities each time native code corresponding to that instruction is produced. Walters emphasizes that the point of taking into account the different possibilities for such instruction when producing corresponding native code is so that non-native instructions do not have to be translated more than once (*see e.g.* column 11, lines 35-37). This approach is different to the invention of amended Claim 13, since no determination is made in connection with prevailing initial and subsequent conditions between initial translation of a portion of program code and subsequent entry of the same portion of the program code. The Walters system can only generate additional target code if the subsequent conditions are the same as the prevailing set of conditions on initial translation, *i.e.*, both sets of conditions establish that no corresponding native code is stored in the cache.

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In addition, Walters does not disclose any concept of compatibility of target code and additional target code, compatibility related to differences between initial prevailing conditions and subsequent conditions.

For at least the foregoing reasons, Walters does not anticipate Claim 13 as amended, and therefore that rejection should be withdrawn. Since claims 19, 24 and 28 depend from allowable claim 13, those claims should also be allowable. In particular, the arguments set forth above also traverse the rejection of claim 28. As demonstrated, Walters does not disclose generating and storing of different target code dependent on changes between initial and subsequent prevailing conditions for the same portion of program code.

35 USC 103 –Obviousness

At ¶9 of the Office Action, the Examiner rejects claims 1-5, 7-12, 15-18, 20-23, 23-25, 29 and 30 under 35 U.S.C 103(a) as being unpatentable over Davidson in view of Walters.

The Applicant discussed the issue of a skilled person's motivation to combine the teaching of Walters with the teaching of Davidson in the Applicant's previous Response. The Applicant respectfully disagrees with the Examiner's reasoning at pages 7-8 of the Office Action, as demonstrated below.

Although a degree of hindsight is inevitable in building up a picture of the knowledge generally available to the person of ordinary skill and when interpreting the teaching of the prior art, that hindsight cannot extend to putting the core concepts of the claimed invention into the head of the skilled person then using parts of the prior art references to build up a mosaic which approximates the claimed invention.

In general terms, Davidson teaches the use of intermediate representation, and Walters teaches optimization in a compiler. However, the Applicant respectfully submits that statements such as "it would have been obvious ... to supplement Walters with an intermediate representation, such as taught by Davidson, so as to provide language independence" and "it would have been obvious ... to supplement the code generation method of Davidson with the code caching feature taught by Walters, for the purpose of increasing efficiency and enabling the reuse of previously generated code" do not show motivation for the combination of the two prior art documents has been established without the use of the unallowable sort of hindsight. In fact,

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these statements appear to be in response to the Applicant's submissions demonstrating that "optimization" in a general sense would not be motivation to combine Walters with Davidson. It is not plausible that these specific statements of motivation reflect the state of mind of the person skilled in the art at the time the invention was made. For example, why would the skilled person consider language independence desirable in a code cross-compiler, when it is clear that providing this capability is very likely to involve a large degradation in performance? Further, why would the skilled person consider that reuse of previously generated code could be useful, when he is faced with a problem relating to facilitation of interactions between the front end and back end of a static compiler? The answers to these questions are not found in the teaching of Walters and Davidson, either separately or when combined. These questions illustrate that not only do Walters and Davidson fail to provide a motivation to combine, they in fact teach away from such a combination.

The Applicant's conclusions on what would result from a combination of Walters and Davidson represent the Applicant's view on what the skilled person would see and do when confronted with these two prior art references. Using an intermediate representation of Davidson into the Walters system would without doubt increase the overall complexity of the Walters system. Nothing is being removed from Walters, yet this intermediate representation is being added. This is a definite, and positive reason why the skilled person would not be motivated to combine the teaching of the two references, and as such we submit must carry more weight than any arguments based on speculation about achieving general "language-independent optimization," as suggested on page 8 of the Office Action.

The above arguments show that there is no motivation for combining the cited prior art, and that independent claims 1, 11, 13, 14, 15 and 16 should therefore not be considered obvious. Those claims should be allowable and the rejections should be withdrawn. The claims depending from allowable claims 1, 11, 13, 14, 15 and 16 should also be allowable.

To further clarify independent claim 1, this claim has been amended in line with the amendments set out above in connection with claim 13. That is, claim 1 now reads:

Claim 1 (currently amended) A method of generating an intermediate representation of program code, the method comprising the computer implemented steps of:

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on an initial translation of a given portion of program code, generating and storing only intermediate representation which is required to execute that portion of program code with a prevailing set of conditions; and

whenever subsequently the same portion of the program code is entered, determining whether the prevailing set of conditions are now different, subsequent conditions ~~intermediate representation has previously been generated and stored for that portion of program code for the subsequent conditions~~, and if no ~~such~~ intermediate representation compatible with the subsequent conditions has previously been generated, generating additional intermediate representation required to execute said portion of program code with said subsequent conditions.

Contrary to the Examiner's assertions on page 13, Davidson does not teach the steps of claim 1. These steps are performed on an initial translation of a given portion of program code. These steps includes the feature that only that intermediate representation which is required to execute that portion of program code with a prevailing set of conditions is generated. Davidson cannot take different sets of conditions into account, and there is no limitation to generation of only the required intermediate representation in Davidson.

Neither Walters nor Davidson, alone or in combination, teaches the limitations of amended claim 1. The novel features of the amended claim 1 that distinguish this claim from Walters are explained above. It is not possible to supplement the features of Walters with any combination of features from Davidson to arrive at the claimed invention. The arguments presented above in relation to non-obviousness of claim 1 also apply to claim 13.

Claim 15 has also been amended corresponding to the amendments to claim 1 and claim 13. The above submissions relating to claims 1 and claim 13 also apply to claim 15.

In connection with claim 11, neither the passages of Davidson cited at the final paragraph of page 20 of the Office Action nor the passages of Walters bridging pages 6-7 of the Office Action teach or suggest blocks of code having unused conditions or functionality. Applicant's previous submission in relation to claim 11 explains why Davidson is not relevant in this area. The Response to Applicant's arguments on page 6-7 does not comment on why Davidson may be considered relevant, rather the focus of the Examiner's objection is transferred to Walters.

The Condition Code Flags (CCFs) of Walters are used in specific circumstances when dealing with branches found commonly at the end of execution loops (see Walters, column 5, lines 31-49). It is not possible to equate the CCFs of Walters to entry conditions. Therefore, Davidson and Walters do not combine to teach the invention of claim 11.

The arguments above in relation to non-obviousness of claim 11 also apply to claim 16.
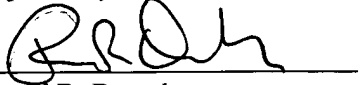
SUMMARY

All claims of the application are novel over Walters. Walters does not include any teaching of determining a change of conditions between an initial translation and a subsequent translation, nor does it teach a way in which such a determination can take place, or motivation for wanting to make such a determination. Walters stresses the importance of minimizing of multiple translation of non-native code. There is no motivation or additional information in the Davidson document that the person of ordinary skill can use to supplement the teaching of Walters. Even if Walters were combined with Davidson, the combination does not provide the claimed invention.

The other dependent claims are all allowable for like reasons, and also referring to the arguments made in response to the previous Office Action. This response deals with all of the rejections raised by the Examiner and we request allowance of the application at your earliest convenience.

In view of the above amendment, applicant believes the pending application is in condition for allowance. Please charge any fees not covered and/or any credits to Deposit Account No.: 08-0219.

Dated: March 10, 2006   Respectfully submitted,

                                               By _____
                                               Ronald R. Demsher
                                                  Registration No.: 42,478
                                               WILMER CUTLER PICKERING
                                                  HALE AND DORR LLP
                                               60 State Street
                                               Boston, Massachusetts 02109
                                               (617) 526-6105
                                               Attorney for Applicant

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